facilities available can no longer support the service demand in a given route."[32] Thus, in the aforementioned example, relief facilities would be provided before the remaining 135 pairs of the non-interfaced cable (900-765) or 90 pairs of the interfaced cable (900-810) are used. If the route is growing at a rate of 3% per year, the critical exhaust date would be approximately 5 years hence for non-interfaced cable or 3+ years for interfaced cable. In either case, the engineer would typically not undertake relief effort but rather continue to monitor the plant until much closer to the critical exhaust date. Typically, the engineer would not begin a relief effort until a year before critical exhaust was likely to occur and the relief effort would be completed less than a year before critical exhaust.

When a relief effort was finally undertaken, the engineer would ordinarily provide for three to five years of growth. Standard industry engineering guidelines state that copper feeder cable should be installed to service all known demand as of the service date of the cable, plus three to five years of growth.[33] Thus, generally accepted engineering practice calls for building sufficient spare pairs to allow reinforcement every three to five years. **[BEGIN VERIZON PROPRIETARY] *** [END VERIZON PROPRIETARY]**

The impact of a relief job on utilization rates can be seen from the following example. Assume a Central Office has a major feeder route serving 5,000 lines and that the route is experiencing a growth rate of 3% per year or 150

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32 Outside Plant Engineering Guidelines, 1998-00397-OSP, (July 20, 1998) at 10.

33 Feeder Administration, AT&T 916-100-013.

lines (5,000 x 0.03), which, as we explain below, is the average growth in the number of lines in Virginia over the last three years. In such a case, a relief job would be planned to complete sometime before the last 150 lines were used. For the sake of simplicity, assume that the relief cable would complete one year before critical exhaust, when 150 lines of spare remained or when 4,850 lines were working. (This is a conservative assumption because relief jobs typically will not complete until much closer to critical exhaust.) The fill at the time of relief would be 97% (4,850 divided by 5,000). Since typically 3 to 5 years growth is provided when relieving a route (3x150=450, or 5x150=750),[34] a minimum of 600 cable pairs or a maximum of 900 cable pairs would be provided due to manufactured cable sizes. Thus, the fill in the route would decline, at most, from 97% to 82% (4,850 divided by 5,000+900) – and this would be the lowest level of fill over the 5 year period.[35] It comports with our experience that copper feeder utilization can conservatively operate at 80% fill.

Q. IS VERIZON CORRECT THAT THERE IS A MANDATORY SPARE CAPACITY LEVEL?

A. No. Verizon claims that a minimum 15% margin of spare capacity is needed to allow for efficient copper feeder operation, administration and management.

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[34] If compounding were taken into account, the real numbers would be 464 lines or 788 lines. For simplicity's sake and because of our otherwise extremely conservative approach, we have ignored this small effect of compounding.

[35] If the relief job were completed when utilization was 99%, utilization after relief would decline to 84%. Moreover, if only three years of spare capacity were provided of a route with 99% fill, utilization would decline to 90%.

There is no sound basis for this conclusion. As explained above, both standard industry guidelines and Verizon's own guidelines call for relief jobs that provide three to five years of spare capacity and then call for relief to occur prior to critical exhaust. Despite Verizon's assertion to the contrary in this proceeding, standard industry practice does not call for "administrative spare" beyond that which is required in the guidelines. In fact, there is no reference to any such minimum 15% spare margin in Verizon's Engineering Guidelines and Outside Plant Engineering Reference Manual produced in discovery in this case. Verizon's reliance on a so-called mandatory "administrative spare" capacity is nothing more than a ruse to lower the utilization rate and raise costs. Moreover, Verizon's proposed low copper fill factor – that reflects a spare capacity beyond that which is required under standard engineering guidelines – would simply yield inefficient amounts of spare facilities that risk technical obsolescence if they are not used over the facility's life cycle.

Q. DO YOU AGREE WITH VERIZON'S ANALYSIS REGARDING THE EFFECT OF BREAKAGE ON THE COPPER FEEDER UTILIZATION RATE?

A. No. Verizon claims that "breakage," or an increase in cable size caused by cable manufacturing constraints, automatically lowers the copper feeder utilization rate.[36] Although breakage does occur, it should have less of an effect than Verizon indicates. The "uncommitted pairs" that result from breakage can be left

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[36] Verizon Cost Panel Testimony at 106.

at points in the network where they can be utilized when new relief jobs occur, for example. Thus, over time, these pairs should be used. Moreover, the effects of breakage are already accounted for in the three-to-five year reinforcement guideline. For example, an engineer may not be able to relieve a feeder route with exactly three years of spare capacity because the smallest cable that would provide at least three years of spare capacity would actually provide four years of spare capacity. The engineer would then provide four years of spare capacity. But he would still act within the guideline.

Q. DO YOU AGREE WITH VERIZON'S ASSERTION THAT DEMAND PEAKS LOWER THE UTILIZATION RATE?

A. No. Verizon claims that "[m]aintaining a margin of available facilities necessary to accommodate unexpected demand peaks efficiently reduces the average utilization of network capacity.[37] However, the demand fluctuations that Verizon describes are part of everyday occurrences in the outside plant and are already engineered into the feeder cables. Moreover, standard industry practice requires that the plant must be clearly monitored and replenished in sufficient time to preclude any service delays.

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[37] *Id.*

Q. DO YOU AGREE WITH VERIZON'S ASSERTION THAT THE DEMAND GROWTH THAT CAUSES CABLES TO EXHAUST AND REQUIRE RELIEF RESULT IN A LOW UTILIZATION RATE?

A. No. Verizon states that "demand growth" causes cables to exhaust and require relief. Verizon then concludes that the continual relief efforts result in utilization rates distributed across some "utilization continuum."

Verizon is mistaken at two levels. First, as explained above, growth in future demand cannot, from a costing perspective, increase the capacity costs properly attributed to current ratepayers. Second, Verizon is mistaken even from an engineering perspective. Although the process cycle from relief to exhaust of facilities does occur, to insinuate, as Verizon does, that that process somehow results in an overall low utilization rate is incorrect and misleading. While it is reasonable to expect that some cables and routes will be reaching critical exhaust while others will have just been replenished, as we have discussed above, this simply means that while some cables and routes will have close to 100% utilization, others – those that have just been relieved – will have three year to five years of spare capacity. Even using the five year figure, the minimum utilization of a route assuming a 3% growth rate on each route will then be 82% and the average will be far higher.

Q. DOES VERIZON'S CLAIM THAT THE 56% FIGURE REPRESENTS ITS ACTUAL UTILIZATION RATE COMPORT WITH YOUR EXPERIENCE?

A. No. In the experience of Mr. Riolo, it is conservative to assume an 80% utilization rate. In addition, if Verizon's utilization rate is really 56%, this would show that Verizon is acting inefficiently. With an average network growth rate of

3% per year, Verizon's 56% utilization rate allows for almost 15 years of growth without the average route in its plant needing any relief. There is no need to provide so much excess capacity. As explained above, if Verizon were following industry standard guidelines or its own guidelines, only three to five years excess capacity would be provided and utilization would be at least the 80% that we have estimated.

Q. IS THERE ANYTHING ELSE WRONG WITH VERIZON'S ASSESSMENT OF UTILIZATION OF COPPER FEEDER?

A. Yes. Verizon further states that the "[t]he smaller the number of units that are actually in service (*i.e.* the lower the utilization) ... the greater is the fraction of the cost of the facility that must be assigned to each filled unit" (emphasis added).[38] Verizon includes defective pairs as non-utilized pairs. But if Verizon acted efficiently there would be few defective pairs in its network. Pairs are not defective when they arrive, and there is no reason that many defective pairs should exist. In any event, in a reconstructed network with brand new copper feeder, there would be few defective pairs.

The data in Verizon's LART Report that is included in its cost study reveal that 429,639 or 6.3% of the cable pairs in Verizon's Distribution Areas ("DAs") are defective. A reconstructed network would not have defective pairs. Because Verizon's copper utilization rate excludes the defective pairs, it is plainly

[38] Verizon Cost Panel Testimony at 36.

evident that Verizon's copper feeder utilization rate is understated by that same margin.

3. RT PLUG-IN UTILIZATION

Q. WHAT IS A PLUG-IN CHANNEL UNIT?

A. A plug-in channel unit is used with Digital Loop Carrier (DLC). DLC systems are deployed to transport calls to and from individual customer signals more efficiently from the Remote Terminal equipment in the vicinity of the customer to the Central Office. As its name implies, the carrier is digital in nature, whereas the signal originating at the customer location is analog. For this reason, the analog signal from the customer's cable pair is converted to a digital signal at the interconnection of the cable pair to the DLC electronics. The conversion takes place at the plug-in channel unit.

Q. VERIZON CLAIMS THAT THE APPROPRIATE FORWARD-LOOKING UTILIZATION RATE FOR DLC SERVICE PLUG-INS IS 80%. DO YOU AGREE?

A. No. Since these channel units are relatively costly but easy to transport and install, prudent inventory control must be used to manage these assets properly. There is no reason to have a significant number of idle units when each unit is expensive and when units can easily be installed if new ones are needed. **[BEGIN VERIZON PROPRIETARY] *** [END VERIZON PROPRIETARY]** Thus, for example, a DLC serving 600 lines and growing at a rate of 3% annually or 1.5% semi-annually would normally be equipped with additional channel units of spare capacity of 9 lines (600 x 0.015). Since POTS channel units serve 4 lines each, a minimum of 3 cards (3 x 4 =12 lines) would be required to meet the requirements for 9 lines. The utilization rate would therefore be 98% (600/612). As a result, a utilization rate of 90% is reasonable and achievable by Verizon on a forward-looking basis.

Q. VERIZON SUGGESTS THAT THE MAXIMUM THEORETICAL UTILIZATION RATE FOR PLUG-INS IS 90%.[39] IS THAT TRUE?

A. No. It is costly, inefficient, and wholly unnecessary to maintain the channel unit plug-in capacity that Verizon recommends. Even Verizon concedes that channel units are easily installed.[40] There is no reason that a rate well above 90% could not theoretically be achieved. Moreover, Verizon's unacceptably low 80% channel unit plug-in fill factor means that it is advocating the maintenance of 20% spare capacity for channel unit cards that will simply sit on DLC RT shelves. Assuming an annual 3% growth in second lines, Verizon's recommended plug-in fill factor means that there would be 7 years of idle spare plug-in cards. In view of the rapid advances in electronic chip technologies, these spare channel units could well become obsolete before they are ever used. Additionally, Verizon's definition of utilization is wrong. The service plug-ins that are left at recently vacated-premises should be counted as cut-throughs or idle assigned units in the numerator of the fill factor ratio. Thus, contrary to Verizon's claim, customer churn would not yield a reduction in the fill factor. In any event, Verizon has not

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39 Verizon Cost Panel Testimony at 108.

40 Verizon Cost Panel Testimony at 107.

shown that an efficient firm in a competitive market would leave a significant number of plug in units in place in unoccupied units.

Q. VERIZON CLAIMS THAT SUFFICIENT CAPACITY TO ACCOMMODATE SHORT-TERM GROWTH DEMAND PEAKS WOULD YIELD REDUCED LEVELS OF PLUG-IN EQUIPMENT UTILIZATION. IS THAT TRUE?

A. No. The 6 months supply of spare channel units recommended in Verizon's own engineering guidelines is designed to accommodate service demands. Service demands include what Verizon euphemistically refers to as "short-term growth" and "peak demands."

Q. COULD YOU SUMMARIZE THE BASIS ON WHICH YOU CHANGED THE RT PLUG-IN UTILIZATION?

A. The adjustment was made based on the fact that plug-in equipment capacity, unlike other components of the outside plant facility, is readily expandable. Lightweight, easily transportable, and installable plug-ins are installed on a regular basis to handle 6-months' worth of growth. At 3-percent annual growth, this would amount to justification for a 98.5-percent fill factor. Thus we believe that 90 percent is conservative.

4. RT COMMON ELECTRONICS UTILIZATION

Q. THE VERIZON PANEL REFERS GENERALLY TO "R.T. COMMON ELECTRONICS." WHAT ARE "COMMON ELECTRONICS"?

A. The term "common electronics" as used by Verizon Panel in this proceeding is misleading. When the Verizon Panel discusses "common electronics,"[41] it appears to refers only to the Litespan 2000 RT Channel Bank Assembly (CBA). But in addition to the Channel Bank Assembly, the Litespan 2000 RT also includes a Common Control Assembly (CCA). Despite this misnomer, the Verizon cost model appears appropriately to include both the common control assembly and the channel bank assembly in apportioning costs for common electronics.

Q. FOR CLARITY, WOULD YOU DESCRIBE THE TWO MAJOR COMPONENTS OF LITESPAN 2000 RT?

A. Yes. The Common Control Assembly is the basic unit that includes the common electronics used to provide DLC. It contains, for example, those electronic plug-in cards that are needed to serve all of the individual lines, such as the Common Optical Group.

The Common Control Assembly can support up to nine Channel Bank Assemblies. The Channel Bank Assembly houses up to 56 channel units (plug-ins), along with a pair of redundant controller cards, three load sharing power supplies and four auxiliary modules. The plug-in units provide service to

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[41] Verizon Cost Panel Testimony at 103

individual lines, and the utilization rate for those units has been discussed separately above.

Q. HOW DOES VERIZON DETERMINE ITS UTILIZATION RATE FOR COMMON ELECTRONICS?

A. Verizon appears to determine the utilization rate for common electronics by simply assuming this utilization rate would be the same as that for copper feeder, which Verizon states is 56.9%. As noted above, Verizon significantly understates the rate for copper feeder. Moreover, the utilization rate for common electronics should be higher than that for copper feeder. Common electronics can be installed much more quickly than copper feeder. The equipment can be purchased pre-assembled at the factory. Thus, the equipment can be installed shortly before the capacity of the existing equipment is reached.

Q. ARE THERE OTHER FLAWS IN THE APPLICATION OF THE VERIZON MODEL TO "COMMON ELECTRONICS"?

A. Yes. The Verizon model apportions the investment associated with the "common electronics" across only POTS loops. Additionally, the model assumes that a 56.9% utilization rate adjustment should be applied based on Verizon's embedded network. The model assumes that the embedded network design is forward-looking. Moreover, the model incorrectly assumes that the minimum size DLC unit is a 224 line equivalent unit.

Q. SHOULD THE VERIZON MODEL APPORTION THE INVESTMENT ASSOCIATED WITH THE "COMMON ELECTRONICS" ACROSS POTS LOOPS ONLY?

A. No. Although Verizon contends that capacity must be relatively low as a result of breakage, services other than POTS services, such as ISDN and DS1 loops, will also utilize the RT common equipment, increasing utilization levels. The "common electronics" as defined by the Verizon model serve a myriad of services that are provisioned over DLC systems, including Special Services and ISDN. Accordingly, it is wholly inappropriate to apportion all of these investment costs over only 2 wire POTS loops, as the Verizon model does, and assess the utilization rate for the common electronics as if they were only used for 2 wire POTS loops.

Q. CAN THE EMBEDDED NETWORK BE CONSIDERED FORWARD-LOOKING FOR THE PURPOSE OF APPORTIONING "COMMON ELECTRONICS"?

A. No. Verizon's assumption that an entire Litespan 2000 unit often will have to be used to serve a relatively small number of customers assumes the current groupings of customers in its embedded network. Under the scorched-node assumption of TELRIC, a new entrant is not bound by existing UAA or DA boundaries. Rather, UAAs and DAs will be redefined to produce grouping sufficiently large to maximize RT common equipment utilization.

By contrast, the patchwork embedded network design has evolved over a number of decades under a variety of circumstances. Further, local engineers, pursuant to vintage guidelines, designed the network to serve an ever-shifting customer base. The net result, the existing embedded network, was planned based on the judgment of numerous individual engineers. This often resulted in the creation of UAAs and DAs which feed into small SAIs. A forward-looking network would use larger SAIs. **[BEGIN VERIZON PROPRIETARY]** *** **[END VERIZON PROPRIETARY]** If large SAIs were used, there would be far fewer instances in which an RT DLC system served a small number of customers and utilization would be significantly higher.

Q. HOW DOES THE VERIZON MODEL'S SELECTION OF A 224 LINE CHANNEL BANK ASSEMBLY AFFECT THE DLC "COMMON ELECTRONICS" INVESTMENT?

A. The common equipment utilization levels Verizon is able to achieve in its cost study are driven, in part, by assumptions relating to the capacity of the common equipment assumed to be deployed in each DA. The Verizon study assumes a minimum RT size of 224 lines. As we explained above, many of the DAs served by Verizon on DLC include only a handful of lines. Serving these with 224-line capacity DLC's results in utilization levels for that expensive equipment that approach zero. A more realistic forward-looking design would provision small DA's with 96, 48, or even 24-line capacity RTs, thereby improving overall DLC utilization. Verizon's selection of a 224-line unit results in lower utilization and higher cost allocation. Verizon-Virginia's Litespan 2000 Planning Guidelines suggest using a 96 line unit that could significantly increase utilization for small line count areas. Moreover, there are a number of DLC products used in the industry that efficiently serve smaller line count areas. A typical small line size unit and its cost is included in Mr. Riolo's Direct Testimony.

Q. IS THE UTILIZATION FACTOR OF 56.9% FOR "COMMON ELECTRONICS" CORRECT?

A. No. Although there is no definitive way to adjust Verizon's proposed utilization rate, it seems reasonable to adjust Verizon's 56.9% estimate to 80% to take into account the mistaken assumptions that form the basis for Verizon's estimate.

5. CONDUIT UTILIZATION

Q. DOES VERIZON APPLY A UTILIZATION FACTOR TO ITS CONDUIT INVESTMENT?

A. Yes. Verizon inappropriately applies a duct utilization factor to conduit investment developed within the LCAM.[42] The utilization factor used by Verizon is **[BEGIN VERIZON PROPRIETARY] *** [END VERIZON PROPRIETARY]** and is based on Verizon's calculations of the ratio of conduit duct occupied to conduit duct available in its embedded network. Application of this embedded utilization factor overstates forward-looking costs.

Q. WHY IS THE APPLICATION OF A CONDUIT DUCT UTILIZATION FACTOR INAPPROPRIATE?

A. Verizon's cost study substantially inflates the cost of conduit by using a completely unjustified duct utilization factor of **[BEGIN VERIZON PROPRIETARY] *** [END VERIZON PROPRIETARY]**. This factor fails to consider that so much spare conduit capacity is not needed in a forward-looking environment and that other assumptions within Verizon's cost model also provide for spare capacity in the underground facility.

First, standard industry practice designates the reservation of only one spare maintenance duct for the entire conduit section. Should a cable failure occur in a conduit section with one spare maintenance duct, a new piece of cable can be pulled into the spare duct, working lines can be thrown into the new piece of cable, and the defective piece of cable can be removed to once again regain one maintenance spare duct. Verizon's utilization factor assumes much more than one spare duct is needed.

Second, Verizon's conduit costs already include spare innerducts, providing for additional spare capacity for fiber cable. Because every 4-inch conduit pipe can hold three of four fiber cables, frequently three or four innerducts are placed within a 4-inch conduit pipe between manholes, each of which can hold one fiber cable. Verizon's cost study assumes that every 4-inch conduit pipe has one spare innerduct for every two in use.[43] Because a typical duct contains three-to-four innerducts, each capable of accommodating a fiber cable, there is ample space for additional fiber if demand warrants – without the need for any spare ducts.

Third, the cables traversing the conduit already include a substantial allowance for spare capacity through the application of cable utilization factors discussed previously. To include additional conduit capacity in the unlikely event the cable capacity is exhausted overstates properly developed TELRIC costs.

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[42] 4.12 Loop Study Formulas.Doc.

[43] *Id.*

Fourth, the utilization of fiber in conduit can be improved to accommodate additional demand by upgrading the electronics at each end of the fiber strand without consuming additional conduit space. In other words, the throughput capacity of the fiber within the conduit can be improved through upgrading the multiplexers, without requiring additional conduit. Thus, Verizon has modeled excessive conduit capacity by applying its conduit fill factor.

Because conduit will not be built unless a foreseeable demand for it exists, at most, one spare maintenance duct is needed per conduit section. Rather than attempting to provide for such a spare through a utilization factor, we conservatively made two adjustments to Verizon's conduit utilization. First, we eliminated Verizon's application of a **[BEGIN VERIZON PROPRIETARY] *** [END VERIZON PROPRIETARY]** conduit utilization. Second, to be safe, we provided for an additional spare 4-inch duct for each foot of installed conduit by adding $0.72 per foot to Verizon's conduit cost. The $0.72 is the material cost per duct foot from the FCC's Synthesis Model. With these adjustments, the forward-looking conduit investment includes adequate capacity to serve anticipated demand.

Q. ARE THERE OTHER PROBLEMS RELATING TO VERIZON'S DEVELOPMENT OF CONDUIT INVESTMENT?

A. Yes. Verizon likely overstates the amount of underground plant in its network as compared to aerial or buried cable and thus likely overstates the amount of conduit needed. Verizon determines the overall cost of conduit by developing a unit cost and applying that cost to the number of conduit feet produced by the

UAAA Model. The UAAA assumptions relating to the mix of the outside plant structure among aerial, buried, and underground plant were based on a survey performed by Verizon engineers and were not carefully scrutinized in the UNE proceeding and thus were not reviewed by the Virginia SCC. Indeed, the LCAM model included with Verizon's 1997 study included over **[BEGIN PROPRIETARY] *** [END PROPRIETARY]** of the distribution plant as underground. Yet, in a recent hearing in New Jersey, Verizon witness Donald Albert explained that there is "very, very little" underground cable in the distribution portion of the plant.[44] This further suggests that Verizon's conduit investment figures are overstated. We have not attempted to adjust for this problem, however.

E. EF&I FACTORS

Q. WHAT ARE EF&I FACTORS?

A. EF&I stands for engineer, furnish and install and represents the costs associated with installing materials in the forward-looking network. Verizon includes EF&I costs in its forward-looking cost study based on its recent experience installing material in its embedded network.

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[44] New Jersey Board of Public Utilities Docket No. TO00060356; January 3, 2001 transcript of Marsha S. Prosini and Donald E. Albert at page 2162.

Q. DOES VERIZON'S COST STUDY CORRECTLY APPLY FORWARD-LOOKING EF&I FACTORS?

A. No. Verizon has made no attempt to establish that its historical experience is at all reflective of the EF&I costs likely to be needed in a forward-looking environment. In fact, because costs actually incurred by Verizon for EF&I investment often involve removal of older equipment along with costs for reconfiguring existing office space, the costs would not and could not reflect the forward-looking efficiencies of a new installation in a new building designed specifically for the equipment. We asked Verizon for details data underlying the loop electronics EF&I factors in an effort to evaluate Verizon's position. To date, Verizon has refused to provide the detailed data.

Q. WHERE HAS VERIZON APPLIED EF&I LOADINGS IN ITS LOOP COSTS?

A. Verizon applies EF&I loadings to its digital loop carrier equipment costs in its loop study. Verizon's DLC unit prices include a combination of prices, some of which already include EF&I costs and others that do not. None of the plug-in investment unit costs in the cost study already include an EF&I factor. Thus each piece of plug-in equipment investment is increased by **[BEGIN VERIZON PROPRIETARY] *** [END VERIZON PROPRIETARY]** for installation. That figure is computed by Verizon based on the ratio of 1998 actual total installed digital circuit equipment investment (both plug-in and hardwire) (FRC Account 257C) to digital circuit material investment (both plug-in and hardwire). By combining plug-in and hardwire equipment to develop its EF&I factor, Verizon masks the fact that the EF&I for plug-in equipment is minimal.

Q. WHY IS THE FACT THAT THE PLUG-IN EQUIPMENT EF&I IS MINIMAL MATTER IN VERIZON'S COST STUDY?

A. Installation of plug-in equipment is a simple matter of snapping the plug-in card into the appropriate slot. A more appropriate EF&I for plug-in equipment is the plug-in only factor from Verizon's historical data. According to Verizon's documents, this factor is **[Begin Verizon Proprietary] *** [End Verizon Proprietary]**. We have applied this factor to plug-in investment in our restatement of Verizon's costs.

F. STRUCTURE SHARING

Q. HOW DO UTILITIES TYPICALLY REDUCE THE COST OF STRUCTURE?

A. Telephone networks typically include aerial cable that is attached to poles, buried cable that travels through trenches, and underground cable that travels through conduits. Because structure represents a significant portion of cost associated with constructing plant, engineers welcome the opportunity to participate in structure sharing arrangements.

Q. DOES VERIZON'S COST STUDY PROPERLY REFLECT SAVINGS ASSOCIATED WITH SHARING OF STRUCTURE?

A. No. Although Verizon's cost study takes into account some sharing of poles,[45] it does not properly account for sharing of buried trenches or conduits. Verizon does not provide for any sharing of the buried trench facility and provides for only *de minimis* sharing of conduit.

Q. IS VERIZON'S APPROACH TO SHARING OF BURIED TRENCHES REASONABLE?

A. No. Verizon's failure to account for any sharing of trenches is a significant omission. Such structure sharing arrangements yield significant cost savings. Joint buried agreements that set forth the terms and conditions for joint buried operations are common in the industry. Typically, the "lead" company (*e.g.*, power company) will notify the participating partners of its intent to open a trench on a certain date. Each of the partners will then ready its respective plant items for inclusion in the trench; and the "lead" company will handle the closing of the trench and any necessary restoration. The cost of the operation may be shared as a billed cost. It is reasonable to estimate that on average there will be at least 3-way sharing of the trench. Opportunities for joint buried operations include utilities (such as Power, Gas, CATV and Telco) and municipal services (Water, Fire/Police Communications). In new building construction, builders are usually amenable to burying Telco plant, provided the material is supplied in advance. When house services (*e.g.*, Water, Gas and Electric) are buried, the cable plant is placed in a common trench by the building contractor at no additional cost. It is therefore reasonable to conclude that the Verizon cost study should be adjusted to reflect the three-way sharing of the trenching operation associated with buried plant.

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[45] Verizon Cost Panel Testimony at 120.

Q. IS VERIZON'S ASSUMPTION OF ONLY DE MINIMIS SHARING OF TRENCHES IN UNDERGROUND PLANT REASONABLE?

A. No. Like buried plant, underground plant requires trenches but also includes conduit through which the cables run. While the conduit may not be shared, the trenches can be shared, just as they can for buried plant.

Underground structure is typically found in more densely populated areas. Municipal regulations generally discourage the indiscriminate opening of streets and sidewalks. Moreover, for safety reasons, it is not unusual for municipalities to prohibit street openings during holidays and inclement weather. Many local municipalities also require that opened streets must be completely repaved, rather than patched. As a result, when streets are opened, restoration costs can be quite high. For these and other reasons, companies look for structure-sharing opportunities. Certainly, the sharing of the trench into which conduits are placed is one such opportunity. Frequently, when roads are widened facilities are removed from the overhead pole line and placed underground. While the construction is in progress, the participants jointly share the open street for placement of conduits and manholes. Although the number of available partners for sharing trenches for underground plant is smaller than for buried plant, it is reasonable to conclude, at a minimum, that the cost of the trench itself can be shared by two partners. This would result in a 50% sharing factor adjustment to the Verizon cost study.

Q. DID THE FCC INCLUDE ANY ADJUSTMENTS FOR SHARING OF TRENCHES IN ITS SYNTHESIS MODEL?

A. Yes. The FCC, in developing the inputs to the Synthesis Model, recognizes that a firm entering the market today would take full advantage of structure-sharing opportunities. Overall, just as we have here, the Synthesis Model assumes that the new telephone entrant would bear 33% of the cost of the buried cable trench and 50% of the underground conduit plant. The difference would be paid by other utilities with which the facilities would be shared.

G. GROWTH

Q. DOES THE VERIZON MODEL PROPERLY HANDLE GROWTH?

A. No. Although the Verizon cost study's input assumptions provide for a large amount of spare capacity in the forward-looking outside plant, Verizon's cost study fails to reflect that as this spare capacity is consumed by new customers in the future, the average cost per line will decline because the initial investment cost will be spread over more lines.

Q. HAVE YOU CORRECTED VERIZON'S STUDY TO PROPERLY ACCOUNT FOR FUTURE ANTICIPATED GROWTH?

A. Yes. The modifications we have made to Verizon's cost study inputs still provide for substantial spare capacity. Thus, unit costs will decrease with future growth. As a result, we have included in our restatement of Verizon's cost studies a **[BEGIN VERIZON PROPRIETARY] *** [END VERIZON PROPRIETARY]** estimate of annual growth. This approximates the average growth in the number of working lines Verizon has experienced in Virginia over the last three years, based on the Loop Analysis Reporting and Tracking (LART) information provided in discovery. It is also consistent with the average growth assumptions used by Verizon's outside plant engineers in projecting repair and maintenance expense savings to be produced by the replacement of cable facilities. We modified the VCost module of the cost studies to compute the present value of 5 years of growth at the forecasted rate. The method we used properly reflects that the cost per unit (i.e., line) will decrease as additional demand units materialize.

H. FORWARD-LOOKING NETWORK ADJUSTMENT FACTOR

Q. WHAT IS THE FORWARD-LOOKING-TO-CURRENT FACTOR INCLUDED BY VERIZON IN ITS COST STUDY?

A. The forward-looking-to-current ("FLC") adjustment is an adjustment factor proposed by Verizon to allegedly compensate for its method of calculating expenses which ostensibly reduces these expenses inappropriately in a forward-looking network. Because Verizon calculates expenses based on the ratio of investment to expenses, expenses will automatically be projected to decrease when investment decreases in a forward-looking network. Verizon therefore adjusts its expenses based on the relationship of forward-looking investment to embedded investment observed by Verizon in the recent New York proceeding. Verizon estimates that an FLC of 80% is needed to properly recover forward-looking expenses.[46]

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[46] *See* Panel Testimony at 75.

Q. HOW IS THE FLC APPLIED IN VERIZON'S STUDY?

A. Verizon multiplies its historical investments by 80% before computing its expense-to-investment ratios, thereby decreasing the investment base and increasing the resulting ratio. This, in turn, increases its forward-looking costs.

Q. IS VERIZON'S FORWARD-LOOKING-TO-CURRENT FACTOR CONSISTENT WITH TELRIC PRINCIPLES?

A. No. Verizon's forward-looking-to-current factor is a thinly veiled attempt to recoup the operating costs of its embedded, inefficient network. It should be rejected.

Q. VERIZON ARGUES THAT SUCH AN ADJUSTMENT IS NECESSARY BECAUSE THE EXPENSE FACTORS ARE BASED ON CURRENT EXPENSE-TO-INVESTMENT RATIOS AND, ON THAT BASIS, LOWER TELRIC INVESTMENT LEVELS WILL EFFECTIVELY PRODUCE A WINDFALL REDUCTION IN EXPENSES. DO YOU AGREE?

A. Absolutely not. Rather than remaining constant as Verizon suggests, expenses will decrease in a forward-looking network. This is so for two reasons. First, productivity is improving over time and Verizon does not take this into account. In other proceedings in which Verizon has introduced a FLC, it first adjusts embedded expenses to make them "forward-looking" by applying a productivity adjustment, absorbing inflation, and making certain other forward-looking adjustments. No such adjustments are made to expenses by Verizon in Virginia. Second, many of the embedded Verizon inefficiencies produced by labor-intensive efforts to use technologically obsolete equipment to serve increasing demand will not exist in the forward-looking environment. Moreover, as telephone technology improves and equipment becomes more sophisticated, it